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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Unit 2: Cells & Cell Processes** | | | | | | | |
| Name: | | Start Date: | | | 10/31/16 |  |  |  |
|  | | Test 3 Date: | | | 11/21/16 |  |  |  |
| Period: Honors | | Teacher: Ms. J | | | |  |  |  |
|  | |  |  |  |  |  |  |  |
| **Cells & Cell Processes** | | Submitted | Resubmit | Correct | Evidence of Learning | Page | Date | Sign-Off |
| **Objective 7:** Summarize the structure and function of organelles in eukaryotic cells (including the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and ways that these organelles interact with each other to perform the functions of the cell. | |  |  |  | Notes: Plant Cells vs. Animal Cells |  |  |  |
|  |  |  | Worksheet: Cell Structure Analogies |  |  |
|  |  |  | Lab: Microscopes |  |  |
|  |  |  | Venn Diagram: Cell Types & Structures |  |  |
|  |  |  | Lab: Cell Adaptations Matching |  |  |
|  |  |  | **QUIZ: Objective 7** |  | **11/14** |

**Unit 2: Cells & Cell Processes**

Start Date: 10/31/16

EOTT Date: 11/21/16

**Objective 6:** Compare prokaryotic and eukaryotic cells in terms of their general structures (plasma membrane and genetic material) and degree of complexity.

*Essential Question:* How do prokaryotes and eukaryotes differ?

*“I Can” Statements:*

* Compare and contrast prokaryotes and eukaryotes

**Objective 7:** Summarize the structure and function of organelles in eukaryotic cells (including the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and ways that these organelles interact with each other to perform the function of the cell.

*Essential Question:* What are the main organelles (nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and their functions?

*“I Can” Statements:*

* Identify the structure and function of organelles
* Explain the interactions of organelles (e.g. nucleolus 🡪 ribosome 🡪 ER 🡪 Golgi)
* Use a compound light microscope

**Objective 8 :**  Explain how homeostasis is maintained in a cell and within an organism in various environments (including temperature and pH).

*Essential Question:* How do cells maintain homeostasis?

*Essential Question:* How do organisms maintain homeostasis?

*“I Can” Statements:*

* Model the way a plasma membrane functions to control the way particles move in/out of a cell
* Predict the movement of water and/or solutes across the cell membrane, given a set of conditions
* Explain how energy is used to maintain homeostasis

**CATALYST 1: TBD**

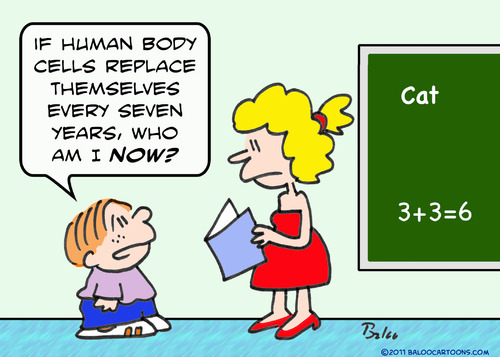
**CATALYST 2: TBD**

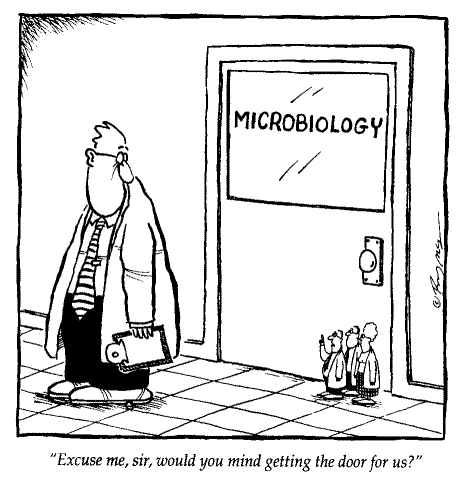
Biology (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Notes: Intro to Cells Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

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Biology I (Honors) Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lab: Cell Structure Analogies Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

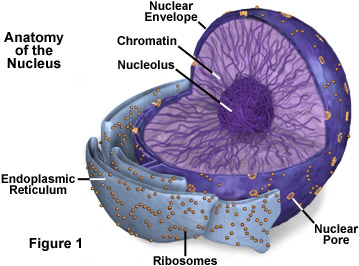
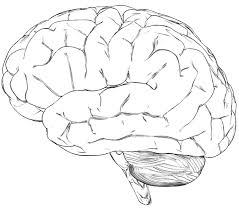
*Use your notes and your Biology book to make analogies of 14 different cell structures from the list below to every day objects. You will need to either draw the pictures, use a magazine/newspaper article, or pictures from the internet to help illustrate your analogy.*

Cell Structures:

* Cell membrane
* Cell wall
* Centriole
* Chloroplast
* Chromatin
* Cilia
* Cytoplasm
* Cytoskeleton
* Flagellum
* Golgi apparatus
* Lysosome
* Mitochondrion
* Nuclear envelope
* Nucleolus
* Ribosome
* Rough ER
* Smooth ER
* Vacuole
* Vesicle

**Example:**

The \_nucleus\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_brain\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



because \_it controls and coordinates the activities of the cell in the same way the brain

\_controls and coordinates the activities of the body.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**1.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**3.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**4.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**5.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**6.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**7.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**8.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**9.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**10.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**11.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**12.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**13.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

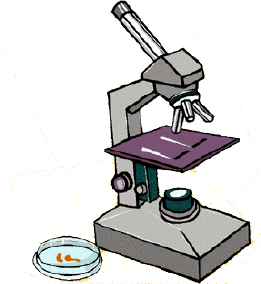
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**14.**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Microscope Lab**

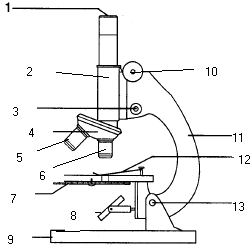
**Introduction**

"Micro" refers to tiny, "scope" refers to view or look at. Microscopes are tools used to enlarge images of small objects so as they can be studied. The compound light microscope is an instrument containing two lenses, which magnifies, and a variety of knobs to resolve (focus) the picture. Because it uses more than one lens, it is sometimes called the compound microscope in addition to being referred to as being a light microscope.  In this lab, we will learn about the proper use and handling of the microscope.

**Materials**

* Compound microscope
* Glass slides
* Cover slips
* Eye dropper
* Beaker of water
* The letter "e" cut from newsprint
* Scissors
* Ruler

**Part I. Examining microscope parts and functions**



Directions: Identify the microscope structure with the correct # and state the function of the part.

#\_\_\_\_\_\_\_\_ eyepiece or ocular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ body tube \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ fine adjustment knob \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ nosepiece \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ high power objective \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ low power objective \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ diaphragm \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ mirror (light source) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ base \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ coarse adjustment \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

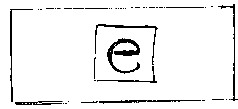
#\_\_\_\_\_\_\_\_ arm \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ stage clip \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#\_\_\_\_\_\_\_\_ inclination joint \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

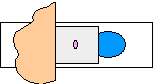
**Part II. Preparing a wet mount of the letter "e”**

1. With your scissors cut out the letter "e" from the newspaper.
2. Place it on the glass slide so as to look like (e).
3. Cover it with a clean cover slip. See the figure below.



1. Using your eyedropper, place a drop of water on the edge of the cover slip where it touches the glass slide. Use a small piece of paper towel on the opposite side to pull the water through.

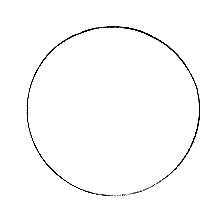
Water from dropper



Specimen under cover slip

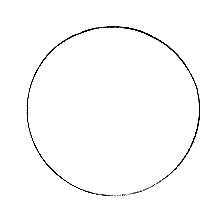
Small piece of paper towel

1. Turn on the microscope and place the slide on the stage; making sure the "e" is facing the normal reading position (see the figure above). Using the course focus and low power, move the body tube down until the "e" can be seen clearly. Draw what you see in the space below.

[](http://www.sc2000.net/~czaremba/images/circle.html)

1. Describe the relationship between what you see through the eyepiece and what you see on the stage.  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Looking through the eyepiece, move the slide to the upper right area of the   
 stage. What direction does the image move? **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**8. Now, move it to the lower left side of the stage. What direction does the image move?  
 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

9. Re-center the slide and change the scope and move to medium power (focus and resolve) then move to high power. You will notice the "e" is out of focus. **Do not** touch the coarse focus knob; instead use the fine focus to resolve the picture. Draw the image you see of the letter e (or part of it) on high power. [](http://www.sc2000.net/~czaremba/images/circle.html)

1. Locate the diaphragm under the stage**.** Move it and record the changes in light intensity as you do so.  
     
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**III. Determining Total Magnification**

1. Locate the numbers on the eyepiece and the low power objective and fill in the blanks below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Eyepiece magnification \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **(X)** | **Objective magnification \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **=** | **Total Magnification \_\_\_\_\_\_\_\_\_\_\_\_\_X** |

1. Do the same for the medium power objective.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Eyepiece magnification \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **(X)** | **Objective magnification \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **=** | **Total Magnification \_\_\_\_\_\_\_\_\_\_\_\_\_X** |

1. Do the same for the high power objective.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Eyepiece magnification \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **(X)** | **Objective magnification \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | **=** | **Total Magnification \_\_\_\_\_\_\_\_\_\_\_\_\_X** |

4.     Write out the rule for determining total magnification of a compound microscope.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Remove the slide and clean it up. Follow teacher directions where materials will be disposed of.

**IV. Measuring Field of View with a Microscope**

1. Use a clear ruler to determine the width of the viewing field under the low power objective. Position the ruler so that the millimeter marks are visible in your viewing field. Remember that there are 1000 micrometers in a millimeter.

**V. Clean up!**

1. Turn off the microscope. Place the low power objective in place and lower the body tube. Cover the scope with the dust cover. Return all materials.

Conclusion Questions

1.      Explain why the light microscope is also called the compound microscope.

2.      Images observed under the light microscope are reversed and inverted.  Explain what this means.

3.      Explain why the specimen must be centered in the field of view on low power before going to high power.

4.       A microscope has a 20 X ocular (eyepiece) and two objectives of 10 X and 43 X.  
  
a.)      Calculate the low power magnification of this microscope.     
 Show your formula and all work.

b.)      Calculate the high power magnification of this microscope.     
 Show your formula and all work.

5.     In three steps using complete sentences, describe how to make a proper wet mount of the letter e.

6.      Describe the changes in the field of view and the amount of available light when going from low to high power using the compound microscope.

7.      Explain what the microscope user may have to do to combat the problems incurred in question #

8.      How does the procedure for using the microscope differ under high power as opposed to low power?

Biology I (Honors) \_\_\_\_\_ Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Venn Diagram: Cell Structure **55 pts** Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

1. Use the Venn diagram below to compare prokaryotic and eukaryotic cells. Place the following structures in the appropriate places:

* Cilia
* Cytoplasm
* Cytoskeleton
* DNA

**Prokaryotic Eukaryotic**

* Endoplasmic reticulum
* Flagella
* Golgi apparatus
* Lysosomes
* Mitochondria
* Nuclear envelope
* Nucleoid
* Nucleolus
* Nucleus
* Plasma membrane
* Ribosomes
* Vacuoles

1. Use the Venn diagram below to compare plant and animal cells. Place the following structures in the appropriate places:

* Cell wall
* Centrioles
* Chloroplasts
* Chromoplasts
* Cytoplasm
* Cytoskeleton
* DNA
* Endoplasmic reticulum
* Golgi apparatus
* Leucoplasts
* Lysosomes
* Mitochondria
* Nuclear envelope
* Nucleolus
* Nucleus
* Plasma membrane
* Ribosomes
* Vacuoles

**Plant Animal**

*\_\_\_\_\_*

1. Imagine that the school building represents a cell. The various parts of the school building would then represent cellular organelles. For each organelle listed below, list the part of the school that would represent that cell part and give an explanation for your answer.

|  |  |  |
| --- | --- | --- |
| **Cell structure** | **Part of the School** | **Explanation** |
| Cell wall |  |  |
| Cell membrane |  |  |
| Cytoplasm |  |  |
| Cytoskeleton |  |  |
| Nucleus |  |  |
| Mitochondria |  |  |
| Chloroplasts |  |  |
| Ribosomes |  |  |
| ER |  |  |
| Golgi apparatus |  |  |
| Vacuoles |  |  |
| Chromoplasts |  |  |
| Leukoplasts |  |  |
| Lysosomes |  |  |

**2 pts**

1. Match the cell parts at the right with their functions at the left.
2. Cell membrane
3. Cell wall
4. Centrioles
5. Chloroplasts
6. Chromoplast
7. Cilia
8. Cytoplasm
9. Cystoskeleton
10. Endoplasmic reticulum
11. Flagella
12. Golgi apparatus
13. Leucoplast
14. Lysosomes
15. Mitochondria
16. Nucleolus
17. Nucleus
18. Ribosomes
19. Vacuole
20. Gel-like substance surrounding the organelles
21. Stores genetic information (DNA); directs cellular activity by producing RNA
22. Produces ribosomes
23. Active in protein synthesis
24. Network of proteins that support the cell and help keep its shape
25. Transport system within the cell; produces lipids
26. processes and packages proteins and other macromolecules
27. Major storage site, primarily for water in plants
28. Contains powerful enzymes for digestion of materials
29. Powerhouse of the cell; site of cellular respiration for ATP production
30. Site of photosynthesis – conversion of sun’s energy into glucose
31. Place in plant cells where starch is stored
32. Pigment storage; gives color to fruits, flowers, fall leaves
33. Used in cell division to help move chromosomes
34. Found outside of the cell membrane in plants; gives support to cells
35. Regulates what enters and exits the cell
36. Long and whip-like; helps provide motility for the cell
37. Short, numerous hairs projecting from the membrane; helps provide motility for the cell

Biology I Honors Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lab: Matching Organism to Adaptations Period: \_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

Explain how specific cell adaptations help cells survive in particular environments.

**Background Information:**

In order to function properly, cells and tissues within organisms have to maintain a steady state (homeostasis), and the cell must constantly adapt in order to do so. Cellular adaptation is defined as the state between a normal, unstressed cell, and an overstressed, injured cell; by definition, cellular adaptation is reversible. Within defined limits, all cells are capable of adapting to a variety of stimuli that may upset normality. These adaptations may include responses to normal stimuli, such as those created by hormones, cytokines, and various other endogenous chemical substances.

However, if the cell’s DNA receives a chemical signal that results in a change in cell type to become a specialized cell, the process of differentiation is underway. Differentiation is the process that stem cells use to change into specialized cells that are each adapted to a specific job or environment. For example, the human body is mostly composed of eukaryotic cells; red blood cells, on the other hand, have lost their nuclei in order to be able to pack more hemoglobin molecules into the cell so that they become more efficient transporters of oxygen. Thus, a stem cell has differentiated into a red blood cell that is specifically adapted to perform its function in the body.

**Questions:**

Match the following cell types (on the left) with its specific adaptation to function (on the right).

* 1. Can change shape to squeeze out of blood vessels and attack bacteria.
  2. Flat disc shape has a large surface area for absorbing more oxygen; no nucleus allows it to carry more hemoglobin molecules.
  3. Long, thin shape for carrying messages around the body; many branches communicate with other cells of the same type.
  4. Long, thin, “hair” increases surface area for absorbing water.
  5. Long, thin, hollow tubes with strong walls for carrying water.
  6. Many chloroplasts for trapping light energy and performing the process of photosynthesis.
  7. Tiny hairs move mucous up from the lungs to the throat so that it can be swallowed and dust particles thereby removed.

1. Ciliated cell   
   (lungs)
2. Nerve cell   
   (neuron)
3. Palisade cell
4. Red blood cell
5. Root hair cell
6. White blood cell (phagocyte)
7. Xylem

|  |  |
| --- | --- |
| http://www.vcbio.science.ru.nl/public/Final-Images/PL_Final685z_151-200/PL0179_685zLeafPetuniaFreshPalisadeChloroplastDetail40x.jpg  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | http://t1.gstatic.com/images?q=tbn:ANd9GcS-8NB-9D7fwnyc3z-3ycatYX9lMQTpzF0Y9-iz1aWdRahYtHrT  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| http://www.microscopy-uk.org.uk/micropolitan/botany/zea_vascular_bundle.jpg  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | https://www.uwosh.edu/med_tech/what-is-elementary-hematology/images/RedBloodCell1.gif/image  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| http://chestofbooks.com/animals/horses/Health-Disease-Treatment-1/images/Nerve-Cells.jpg  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | http://upload.wikimedia.org/wikipedia/commons/0/09/Neutrophils.jpg  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| http://whyquit.com/joel/cilia1a.jpg  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | http://www.fertilityformen.com/images/2spermcropped.jpg  Cell Type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  *BONUS!!!* |